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this acid butter were stored up against years of scarcity; but we read, 'when the sour butter is too old, it loses in its acidity and weight, dries up, and acquires a *rancid* taste.' The most remarkable reference to the substance under consideration, and one that serves to throw most light upon the subject, is that contained in Debe's Description of the Faroe Isles in 1670; it is there called (according to the English translation) preserved tallow and 'Rue tallow,' and was thus treated: the tallow, principally obtained from sheep, was cut in pieces, and allowed to rot awhile; it was then rendered, and cast into large pieces, which 'they dig and put in moist earth to keep it, it growing the better the longer it is kept, and when it is old and is cut, it tasteth like old cheese. The most able peasants have ever much endeavoured to bring together a great quantity of that tallow, so that a countryman had sometimes in the tallow dike (that is, a place in the earth where it is kept) above 100 loads, and this hath always been looked upon as the greatest riches of Feroe. For when sheep dye, such tallow is very necessary in the land, the longer it is kept being so much the better; and forreign pyrates having little desire to rob it from them. It may, therefore, not unreasonably be termed a hidden treasure, which rust doth not consume, nor thieves steal away.' "*

Mr. David Moore and Dr. Aldridge made some remarks.

Rev. J. H. Jellett read a Paper on the effect of the internal fluidity of the earth on the length of the day.

The researches of Mr. Hopkins have shown that the effect of the action of the sun and moon upon the spheroidal figure of the earth, is to cause a separation between the axis of rotation of the external shell, and the axis of rotation of the internal fluid.

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* "Fœroæ, et Fœroa Reserata; that is, a Description of the Islands and Inhabitants of Foeroe. Written in Danish, by Lucas Jacobson Debes, M. A., and Provost of the Churches there. Englished by John Sterpin, Doctor of Physic." London, 1676.

The effect of such a separation will plainly be to develop a force of friction between the fluid and the shell. It becomes, then, a question of considerable importance to ascertain whether this friction, which of course exercises a retarding force upon the velocity of rotation, produces any appreciable effect upon the length of the day.

For very small relative velocities, as in the present case, the force of friction may be taken to be proportional to the velocity. If, then, ω represent the velocity of rotation of the earth, y the distance of any point on the inner surface of the shell from the axis of rotation of the shell, and a the angle between this axis and the axis of rotation of the fluid, it is easy to see that the moment of the friction round the axis of rotation will be

$$k\omega\,(1 - \cos a) \int y^2 dS,$$

k being a constant depending upon the nature of the fluid, and dS the element of the surface. Assuming the shell to be spherical, which is very nearly true, and extending the integral through the entire surface, this becomes

$$\frac{8\pi k\omega}{3}\,a^4\,(1 - \cos a),$$

a being the internal radius of the shell. The equation of rotation of the shell will be, therefore,

$$Mk'^2\,\frac{d\omega}{dt} = -\,\frac{8\pi k a\omega^4}{3}\,(1 - \cos a),$$

Mk'^2 being the moment of inertia of the shell.

The author then proceeds to perform the calculation, on the supposition that the earth is filled with a fluid, whose force of friction is such that it would in 1′ reduce to its $\frac{1}{100}$th part, the velocity of a sphere composed of a material similar to that of the earth's crust, and whose diameter is one foot. Even with a fluid nucleus exercising so powerful a friction as this, he finds that for a thickness of shell = 20 miles, the increase in the length of the day in 3000 years would be less than

$$0''.01.$$

In fact, the increment would be much less than this; for this calculation is made upon the supposition, that the separation between the arcs has at all times its maximum value; and that this value is that which it would have if no friction existed. The real separation, is, of course, much less than this.

If the crust of the earth had a thickness of 1000 miles, the increment would probably be less than

$$0''.0001.$$

For a particular thickness of crust, determined by Mr. Hopkins to be about 800 miles, the foregoing reasoning ceases to be applicable, and the separation might attain a much greater value; but, with our present imperfect knowledge of the laws of motion of viscous fluids, it seems impossible to give a complete solution of the question.

Mr. Hennessy, the Rev. Samuel Haughton, and Mr. Jukes, made some remarks on Mr. Jellett's Paper.

The President called the attention of the Academy to the fact that the Council had authorized the late President, Rev. Dr. Robinson, and the Rev. Dr. Lloyd, on their part, to join the University of Dublin, and other institutions in this city, in an invitation to the British Association for the Advancement of Science, to hold their annual meeting for 1857 in Dublin; whereupon—

IT WAS RESOLVED,—That the Academy do highly approve of the action of the Council in this matter, and request the President to convey to the permanent officers of the British Association their complete concurrence in the invitation.